

Entek Grb LLC
Battle Mountain Federal 14-10L Stage: 3

23cP pHaser Frac
DATE: 10/8/2011
SO#: 8531424
Mid Perf (ft): 6,630

Stage	Fluid Type	Perfs (ft)	Proppant Type	Clean Volume (gal)	BH Foam Vol (gal)	Prop Conc (ppg)	BH Prop Conc (ppg)	Prop Total (lbs)	BHST 169 °F	Slurry Vol (bbls)	Clean Rate (bpm)	Slurry Rate (bpm)	BH Rate (bpm)	Max Press (psi)	Min Press (psi)	Gelling Agent					Clay Cont / Surfactant	Surfactant / Foamer	Surfactant / Foamer	Breaker / Activator	Breaker / Activator	Breaker / Activator	Breaker / Activator	Conductivity Endurance	Conductivity Endurance	Other	Other																	
																WG-18 (ppt)	CL-37 (gpt/ppt)	CL-40 (gpt/ppt)	BA-20 (gpt/ppt)	BA-20 (gpt/ppt)																												
1	Treated Water			1,309	1,309				31.2	13.7	13.7	13.7									0.50	0.50									0.30																	
2	15 % HCL Acid			1,293	1,246				30.8	14.9	14.9	14.9																																				
3	23 vis pHaser			4,004	10,412				95.3	15.1	15.1	18.0	4264			30.00	1.20	0.50	3.00	1.00		0.50	0.50	5.00	4.00	1.00					0.30																	
4	23 vis pHaser	100 Mesh		4,095	9,113	1.22	0.50	4,996	102.9	10.9	11.5	25.1	4264	2811		30.00	1.20	0.50	3.00	1.00		0.50	0.50	5.00	4.00	2.00					0.30																	
5	23 vis pHaser	20/40 Ottawa		5,281	11,056	10.19	3.00	53,813	183.9	12.8	18.7	31.9	2856	2601		30.00	1.20	0.50	3.00	1.00		0.50	0.50	5.00	4.00	3.00					0.30																	
	Growler @ Flush															45.00			3.00																													
6	Foam Flush			2261	5315				53.8	20.5	20.5	33.3	2902	2470								0.50	0.50	5.00							0.30																	
6	Flush Cap			5107	8805				121.6													0.50	0.50	5.00																								
Prop Total:																58,809	lbs	Calc Amt (gal-lb):		401.40	16.06	6.69	40.14	13.38		8.48	11.03	103.74	53.52	28.04																		
Actual Amt (gal-lb):																		Variance (%):		406.6	14.2	5.9	39.8	13.3		7.8	11.0	102.7	56.2	25.9																		
																				1.3%	-11.6%							-1.0%	5.0%	-7.6%																		

Gel System: 13,380 (gal)
% Pad: 69.2% (including breakdown)
Total Fluid: 23,350 (gal)
Total Slurry: 26,019 (gal)
Prop Laden Fluid: 12,045 (gal)
Total Fluid to Recover: 686,377,181 (bbls) includes csg

Casing Vol: 10,908 (gal) 260 (bbls)

Stage	Foam Rate / Volume	
	CO2 Rate	CO2 Gone
1		
2		
3	11.3	13
4	9.6	28
5	14.0	53
6	12.0	58

BREAKDOWN / ISIP DATA

Int. WHP Break: 4262 psi @
Break down Vol: 5430.6 gal
Base Fluid: 8.34 ppg
8.4 bpm
129.3 bbl

TREATMENT SUMMARY

Max Rate: 20.5 bpm
Min Rate: 11.5 bpm
Avg Rate: 15.7 bpm
Max Pressure: 4264 psi
Min Pressure: 1847 psi
Avg Pressure: 1847 psi
Max BH Rate: 33.3 bpm
Min BH Rate: 13.7 bpm
Avg BH Rate: 18.7 bpm
ISDP: 2690 psi
Frac Gradient: 0.839 psi/ft
Max CO2 Rate: 14.0 bpm
Min CO2 Rate: 9.6 bpm
Avg CO2 Rate: 11.7 bpm
Max CO2 Press: 2811 psi
Min CO2 Press: 1847 psi
Avg CO2 Press: 1847 psi

PROPPANT INFORMATION

!! Use weight slip values !!
Prop Type / Mesh Quantity
20/40 Ottawa 19880 lbs
100 Mesh 5000 lbs
Total Prop on Location: 24880 lbs
Sand Screw Total 31009 lbs
Densometer Prop Total 24523 lbs
24880 lbs. of proppant placed

VARIANCE (%)
170.7%
-0.1%

ENERGIZED FLUID

Cool Down: 4 TONS
Total Strap CO2 Downhole: 57 TONS
Total CO2 + Cool Down: 61 TONS
Total Design CO2 Downhole: 58 TONS
Variance % From Design: -2.5%

136.4% Variance From Weight Tickets

24.6%

-1.4%

100.0% Proppant placed

JOB COMMENTS

Well was on the suck, saw pressure in S3. Adjusted CO2 and slurry rate on the fly due to pressure downhole. Watched BH Int Phase for surface rates. SP was ran on both DA 1 & DA 2. Extended flush to see BHPC go down to 2 lb/gal. All proppant placed, good job by crew.

Crew: Green
Halliburton Engineer: Justin Shed
Treater: Kevin Frazier
Production Co. Rep: Kristen Stocks
Consultant:
START JOB: 11:39 AM
END JOB: 12:24 PM

Job Summary -- Surface

